

AMENDMENTS TO THE CLAIMS:

The following list of claims replaces all prior listings and versions of claims in this application:

1. (Previously Presented) A semiconductor structure comprising:
a semiconductor substrate of a first material comprising germanium or a Group(III)-Group(V)-semiconductor or alloy thereof;
a crystalline epitaxial graded buffer layer upon the first material; and
a crystalline epitaxial substantially relaxed layer on the buffer layer wherein the buffer layer is sufficiently relaxed to provide relaxation of the substantially relaxed layer deposited thereon, wherein the graded buffer layer has a concentration of germanium that decreases between the substrate and the relaxed layer.
2. (Cancelled)
3. (Previously Presented) The structure of claim 1 wherein the first material is germanium and the concentration of germanium in the graded layer decreases from 100 percent germanium to about 40 to 80 percent germanium.
4. (Original) The structure of claim 3 wherein the relaxed layer has a substantially constant silicon concentration of about 20 to 60 percent.
5. (Original) The structure of claim 1 wherein the semiconductor substrate comprises at least one of a single crystal germanium wafer, a single Group(III)-Group(V)-semiconductor wafer, a substrate having an epitaxial germanium layer, or a substrate having an epitaxial Group(III)-Group(V)-semiconductor layer.
6. (Original) The structure of claim 1 further comprising at least one crystalline epitaxial strained layer on the relaxed layer that is composed of a second material which is different from the first material.

7. (Original) The structure of claim 6 wherein the strained layer is a silicon layer.

8. (Original) The structure of claim 6 wherein the strained layer is less than 50 nanometers thick.

9. (Original) The semiconductor structure of claim 1 further comprising:
an insulator layer; and
a base substrate, so that the structure is a crystalline epitaxial substantially relaxed layer on an insulator.

10. (Original) The structure of claim 9 further comprising a strained crystalline epitaxial layer on the insulator layer or on the substantially relaxed layer.

11. (Currently Amended) A semiconductor structure comprising:
a semiconductor substrate of a first material comprising germanium or a Group(III)-Group(V)-semiconductor or alloy thereof;
a crystalline epitaxial graded buffer layer upon the first material;
a crystalline epitaxial substantially relaxed layer on the buffer layer wherein the buffer layer is sufficiently relaxed to provide relaxation of the substantially relaxed layer deposited thereon; [[and]]
a weakened zone in the substantially relaxed layer;
an insulator layer; and
a base substrate, so that the structure is a crystalline epitaxial substantially relaxed layer on an insulator.

12. (Currently Amended) A semiconductor structure comprising:
a semiconductor substrate of a first material comprising germanium or a Group(III)-Group(V)-semiconductor or alloy thereof;
a crystalline epitaxial graded buffer layer upon the first material;

a crystalline epitaxial substantially relaxed layer on the buffer layer wherein the buffer layer is sufficiently relaxed to provide relaxation of the substantially relaxed layer deposited thereon;

an insulator layer;

a base substrate, so that the structure is a crystalline epitaxial substantially relaxed layer on an insulator; and

a strained crystalline epitaxial layer on the insulator layer or on the substantially relaxed layer;

wherein at least one of the buffer layer and the relaxed layer comprises carbon.

13. (Cancelled)

14. (Withdrawn, Previously Presented) The structure of claim 11 wherein the first material is germanium and the germanium concentration through the buffer layer decreases from 100 percent to about 40 to 80 percent.

15. (Withdrawn, Previously Presented) The structure of claim 14 wherein the relaxed layer has a substantially constant silicon content of about 20 percent to about 60 percent.

16. (Withdrawn, Previously Presented) The structure of claim 14 further comprising at least one additional crystalline epitaxial strained layer of a second material which is different from the first material, with the additional layer being present on the relaxed layer.

17. (Withdrawn, Original) The structure of claim 16 wherein the strained layer is a silicon layer.

18. (Withdrawn, Currently Amended) The structure of claim [[11]] 1 which further comprises a weakened zone in the buffer layer to facilitate transfer of at least the relaxed layer.

19. (Cancelled)

20. (Withdrawn, Previously Presented) The structure of claim 1 wherein the buffer layer includes a graded layer and a substantially relaxed layer.

21. (Withdrawn, Previously Presented) The structure of claim 20 wherein the weakened zone is provided in the substantially relaxed layer.

22. (Withdrawn, Previously Presented) The structure of claim 21 wherein the further layer is an insulator layer, so that the insulator layer and part of the relaxed layer can be transferred.

23. (Withdrawn, Previously Presented) The structure of claim 22 wherein the insulator layer is bonded to a base wafer, and is detached along the weakened zone in the relaxed layer to form a semiconductor structure that includes a portion of the relaxed layer, the insulator layer, and the base wafer.

24. (Withdrawn, Previously Presented) The structure of claim 23 which further comprises a strained crystalline epitaxial layer on the portion of the relaxed layer of the transfer structure.

25. (Withdrawn, Currently Amended) The structure of claim 21 wherein the further layer is an epitaxially grown strained layer.

26. (Withdrawn, Previously Presented) The structure of claim 25 which further comprises an insulator layer on the strained layer.

27. (Withdrawn, Previously Presented) The structure of claim 26 wherein the weakened zone is provided in the boundary plane between the relaxed layer and the strained layer and the insulator layer is bonded to a base wafer.

28. (Withdrawn, Previously Presented) The structure of claim 27 semiconductor structure that includes the strained layer, the insulator layer, and the base wafer is formed after detachment along the weakened zone in the boundary plane.

29. (Withdrawn, Previously Presented) The structure of claim 28 wherein any residual portion of the relaxed layer is removed from the strained layer.

30. (Withdrawn, Previously Presented) The structure of claim 29 wherein the strained layer is less than 50 nanometers thick.

31. (Withdrawn, Previously Presented) The structure of claim 24 further comprising a heat treated the structure.

32. (Withdrawn, Previously Presented) The structure of claim 11 wherein the weakened zone is provided by atomic species after depositing the further layer.

33. (Withdrawn, Previously Presented) The structure of claim 12 wherein the carbon composition is at a level below one percent.

34. to 36. (Cancelled)

37. (Withdrawn, Previously Presented) The structure of claim 1 wherein the semiconductor substrate comprises at least one of a single crystal germanium wafer, a Group(III)-Group(V)-semiconductor wafer, a substrate having an epitaxial germanium layer, or a substrate having an epitaxial Group(III)-Group(V)-semiconductor layer.